Navy Environmental Quality Fact Sheet

Do you use chlorine gas or bulk sodium hypochlorite for disinfection?

Would you like to improve this process in the following areas?

- ***Meet environmental compliance regulations***. Eliminate hazardous material transportation and handling, storage and containment, risk management planning, OSHA and HAZMAT training, and safety requirements. Media area is water.
- ***Improve workers' safety and health***. Replace chlorine gas cylinders with a safe, non-hazardous alternative.
- ***Increase productivity***. No change to current operations.
- ***Save money***. Reduce hazardous materials management costs.

Sodium Hypochlorite Generation Equipment

Sodium hypochlorite is an effective alternative to chlorine gas or bulk hypochlorite for potable water disinfection, marine growth control, and other disinfection applications. Sodium hypochlorite can be generated onsite using a safe, simple, and economical process. One pound of chlorine equivalent can be produced from 3.5 pounds of salt, 15 gallons of water, and an electrical power source. The salt is dissolved into a brine solution, which is diluted and passed across electrodes powered by a low voltage direct current. The result is a 0.8% sodium hypochlorite solution which can be stored in a day tank and injected into the distribution system by a metering pump as needed. The only by-product is hydrogen gas, which can be vented to the atmosphere. The dilute (0.8%) solution is stable, does not degrade, and is below the concentration threshold for hazardous materials (1.0%). ***Onsite generation of sodium hypochlorite is being successfully performed at PWC Pearl Harbor, NAWS China Lake, and Submarine Base Bangor.***

How can you achieve these improvements?

Generate sodium hypochlorite onsite for disinfection applications.

How does this equipment work?

Sodium hypochlorite can be generated locally using only salt and water.

How will this equipment save you money?

Reduces costs associated with hazardous materials management, such as transportation and handling, storage and containment, record-keeping, and training. Controls final costs by generating only the amount of disinfectant required for routine operations.

How can this method eliminate or reduce pollution?

This P2 method can eliminate the use of hazardous materials used for disinfection. Implementation of this technology will result in the following pollution reductions:

- Reduce the amount of hazardous materials stored onsite.
- Reduce the amount of empty storage containers that must be handled as hazardous waste.

Which applications can benefit most from this method?

Sodium hypochlorite can be used as an alternative to disinfection using chlorine gas or bulk hypochlorite. Typical activities include:

- Water treatment and disinfection
- Marine growth control
- Swimming pool chlorination
- Wastewater treatment
- Chemical sanitizing
- Laundry bleaching

How can this method reduce regulatory compliance concerns?

Onsite generation of sodium hypochlorite can reduce workers' exposure to hazardous materials. Implementation will result in the following regulatory compliance benefits:

- Helps facilities reduce the quantity of hazardous substances stored onsite below threshold limits that trigger EPCRA Section 311/312 Tier II reporting requirements (EPCRA, 40 CFR 370).
- Helps facilities eliminate onsite quantities of chlorine which may require the facility to comply with Risk Management Plan regulations.
- Helps facilities avoid exceeding hazardous materials use thresholds for which Occupational Safety and Health Administration (OSHA) Process Safety Management (PSM) rules apply.

Achieving Environmental Compliance Through Pollution Prevention

Every day the Navy faces the challenge of operating and maintaining the fleet while complying with environmental regulations. This burden can be reduced by using pollution prevention technologies and methods to reduce compliance requirements. This fact sheet is one in a series designed to encourage activities to use pollution prevention technologies and methods. The overall goal of this series is to promote sustained environmental compliance at the lowest life-cycle cost.

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